



# *Joint Program Executive Office Joint Tactical Radio System*

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## **CORBA Neutral Representation**



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JTRS SCA Working Group

**JPEO JTRS**



# Task Overview

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- **Objective**

- Transform SCA to a platform independent representation
  - Removes the current specification of CORBA, DTD technologies as the only path for SCA compliance

- **Benefits**

- Expands SCA applicability to additional form factors and architectures
- Facilitates new technology incorporation within SCA compliant products
- Increases ability of SCA products to align with platform specific requirements

- **Impact**

- Does not disallow / discourage SCA v2.2.2. technology mapping as a valid or legitimate alternative, but requires definition of additional mappings on an as needed basis
- Requires creation of new test tools with expansion of technology base
- Necessitated changes in SCA specification



# Priorities

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- **Prioritization is to define a technology independent:**
  - Core Framework
  - Descriptors
  - Underlying RTOS
- **Provide a set of mapping rules that create an additional technology specific SCA representation**
- **This task was not intended to optimize the SCA model**



# Accomplishments

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1. Remove CORBA specific wording
2. Modify SCA interface model representation (UML) to one that can be mapped to several target technologies
3. Modify / remove any remaining (non-interface) model views to eliminate CORBA
4. Define mapping rules to create existing SCA equivalent
5. Define mapping rules to product a second technology target (TBD)



# **CORBA Neutral Impacted Documents**

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- **SCA (Main Specification)**
- **APPENDIX E – PSM - TRANSPORTS AND TECHNOLOGIES**
- **APPENDIX E.1: PSM CORBA**
  - APPENDIX E.1: PSM CORBA ATT 1 & ATT 2
- **APPENDIX E.2: PSM - C++**
- **APPENDIX E.3: PSM IDL**



# Modify interface model representation

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- **Represent SCA in Unified Modeling Language (UML)**
  - UML is language agnostic and has a standardized visual representation
  - MetaObject Facility (MOF) and UML extension mechanisms provide the ability to design and realize mappings from UML to almost any target
  - A UML -> X mapping is not burdened by any underlying technology assumptions
  - May be leveraged by tools to provide code generation or be linked with other system engineering tools.
- **Related Activities**
  - Developed model artifacts (used as the basis for document figures)
  - Plan in place to maintain model as part of the spec



# UML to PSM mapping

	UML Representation	CORBA Representation	C++ Representation
<b>MODEL</b>	Interface	Interface	Class, which within the framework will inherit the Object representation
<b>ELEMENTS</b>	Exception	Exception	Exception mechanism with exceptions mapped to classes that derive from std exception
	Object	Object	An abstract class whose standard operations are constructors, copy constructors, destructors, and assignment operators
	Primitive (integer, Boolean, string, unlimited natural), others are constructed by layering formatting or constraints on top of primitives	Corresponding Primitive	Corresponding Primitive
	Struct	Struct	struct
	Sequence	Sequence definition	Pointer list of corresponding type
	Any	Any datatype	Approach modeled on boost library any definition
	Type	Typedef	typedef
	Package	Module	namespace
	No return value from an operation	void	void
	enumeration	enum	enum
	A constrained integer data type that corresponds to an Octet	octet	Unsigned char
	attribute	attribute	Member variable



# Define UML to PSM mappings

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- **UML to PSM mapping**

- Intent is for SCA Next to be a catalyst
- Future mappings defined on an as needed basis by community and then introduced as standardization candidate

- **Future Activities**

- Reflect mapping changes in an appendix
- Introduce any technology specific changes within appendix (e.g. CORBA/e)
- Provide PSM artifacts such as IDL or header files as part of appendix